

WHAT IS CLAIMED IS:

1 1. An integrated circuit comprising:
2 a graphics pipeline; and
3 a frame buffer interface,
4 wherein the graphics pipeline comprises a shader coupled to a texture cache, the
5 shader further coupled to the frame buffer interface,
6 wherein the shader stores and loads data to and from an external graphics memory
7 using the frame buffer interface, and the shader is configured to store and load data to and from
8 specific locations in the external graphics memory during a single pass through the graphics
9 pipeline.

1 2. The integrated circuit of claim 1 wherein the shader executes instructions
2 forming a shader program, the shader program executed during a plurality of passes.

1 3. The integrated circuit of claim 2 wherein one of the plurality of passes
2 comprises:
3 executing a first plurality of instructions;
4 executing a read command, wherein data is read from a buffer in the external
5 graphics memory and received by the shader using the frame buffer interface; and
6 executing a second plurality of instructions.

1 4. The integrated circuit of claim 2 wherein one of the plurality of passes
2 comprises:
3 executing a first plurality of instructions;
4 executing a write command, wherein data is written to a buffer in the external
5 graphics memory by the shader using the frame buffer interface; and
6 executing a second plurality of instructions.

1 5. The integrated circuit of claim 1 wherein the shader may write to and read
2 from a first number of buffers located in the external graphics memory, the first number greater
3 than two.

1 6. The integrated circuit of claim 3 wherein the first number of buffers are
2 read-only buffers.

1 7. The integrated circuit of claim 5 wherein the first number of buffers are
2 read/write buffers.

1 8. A method of generating a computer graphics image comprising:
2 executing a first plurality of instructions in a shader program, the shader program
3 running in a shader in a graphics pipeline, the shader program executed during a plurality of
4 passes through the shader;
5 executing a load command, wherein data is read from a first buffer by the shader;
6 and
7 executing a second plurality of instructions in the shader program,
8 wherein the first plurality of instructions, the load command, and the second
9 plurality of instructions are executed during a single pass through the shader.

1 9. The method of claim 8 wherein the shader may load data from a plurality
2 of buffers, the plurality of buffers exceeding two buffers.

1 10. The method of claim 8 further comprising:
2 executing a store command, wherein data is stored by the shader in a second
3 buffer; and
4 executing a third plurality of instructions in the shader program,
5 wherein the first plurality of instructions, the load command, the second plurality
6 of instructions, the store command, and the third plurality of instructions are executed during a
7 single pass through the shader.

1 11. The method of claim 10 wherein the shader may store data in and load
2 data from a plurality of buffers, the plurality of buffers exceeding two buffers.

1 12. The method of claim 11 wherein the buffers are located in an external
2 graphics memory.

1 13. The method of claim 12 wherein the shader stores data in and loads data
2 from the buffers using a frame buffer interface.

1 14. An integrated circuit comprising:
2 a frame buffer interface; and
3 a graphics pipeline coupled to the frame buffer interface, the graphics pipeline
4 comprising a shader coupled to a texture cache,
5 wherein the shader may access a plurality of buffer storage locations in a graphics
6 memory using the frame buffer interface,
7 wherein the plurality of buffer storage locations exceeds two storage locations.

1 15. The integrated circuit of claim 14 wherein the graphics memory is not on
2 the integrated circuit.

1 16. The integrated circuit of claim 15 wherein the shader may read data from
2 the plurality of storage locations using the frame buffer interface.

1 17. The integrated circuit of claim 15 wherein the shader may read data from
2 and write data to the plurality of storage locations using the frame buffer interface.

1 18. The integrated circuit of claim 17 wherein the shader reads and writes data
2 to and from the plurality of storage locations using the frame buffer interface by using load and
3 store commands in the shader program that include storage location identifications.

1 19. The integrated circuit of claim 17 wherein the shader reads and writes data
2 to and from the plurality of storage locations using the frame buffer interface by using load and
3 store commands in the shader program that include a direct reference to storage location
4 addresses in the graphics memory.

1 20. The integrated circuit of claim 17 wherein the shader reads and writes data
2 to and from the plurality of storage locations using the frame buffer interface by using load and
3 store commands in the shader program that include indirect references to storage location
4 addresses in the graphics memory.